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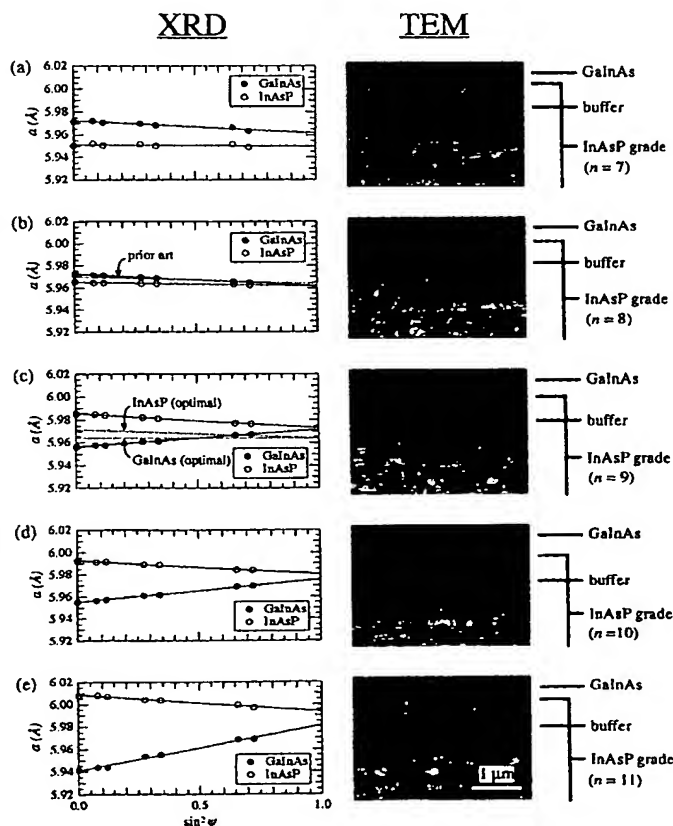
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(54) Title: METHOD FOR ACHIEVING DEVICE-QUALITY, LATTICE-MISMATCHED, HETEROEPITAXIAL ACTIVE LAYERS



(57) Abstract: A method is provided for achieving device-quality active layers in lattice-mismatched-heteroepitaxial systems. The method eliminates strain and dislocations resulting from lattice mismatch with respect to the substrate (12) of a heteroepitaxial active layer (14). The optimized heterostructure comprises a substrate (12), a compositionally step-graded region terminated with a buffer layer (14), an intermediate region (16), an active layer (18), and a capping layer (20). Concepts of the invention are demonstrated in double heterostructures containing the semiconductor alloys $\text{Ga}_x\text{In}_{1-x}\text{As}$ and $\text{InAs}_y\text{P}_{1-y}$.

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